DES646
Course Project

RFP RESPONSE *AGENT*

By Team : **QUINTET**

Problem : Manual RFP handling is limiting growth and competitiveness in the industrial B2B tender market

What is RFP ?

A formal document issued by an organization to invite vendors or suppliers to propose solutions for a specific project or requirement.

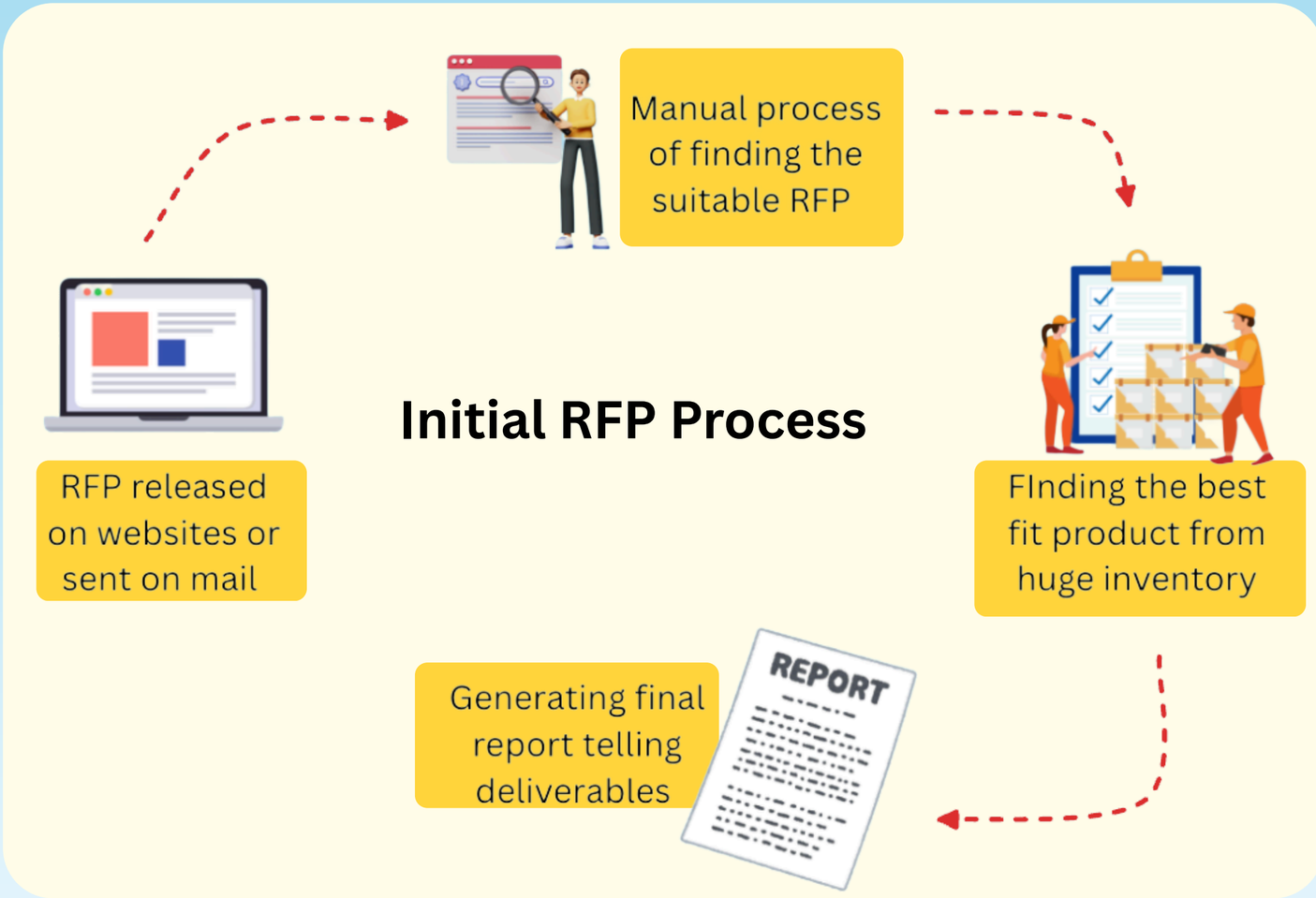
What an RFP typically includes ?

- Project scope & technical specifications
- Quantity and quality requirements
- Testing or compliance standards
- Pricing and delivery timelines

Who issues it?

Usually government departments, PSUs, or large private contractors (LSTKs) issue RFPs to OEMs and suppliers.

Typical length ranges from 20–50 pages, depending on project scale and detail



User Persona

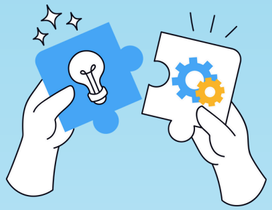
Shyam Gupta
Sales Manager

- **Goal**: Identify RFPs early & increase submission rate
- **Pain Points**: Late tender discovery, manual coordination, missed deadlines
- **Need**: Automated RFP alerts & quick summaries
- **How AI Help**: Sales Agent scans websites, summarizes RFPs, and triggers workflow

Amar Behra
Technical Manager

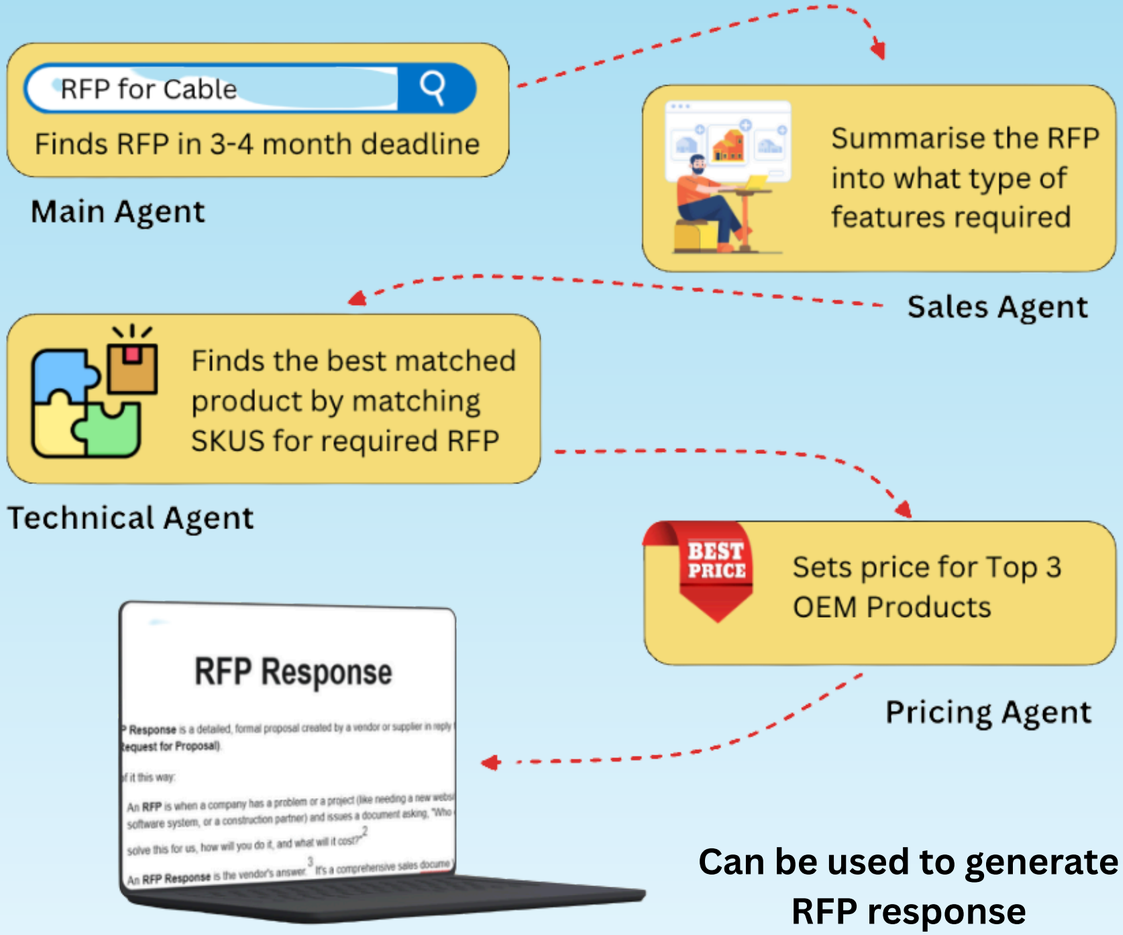
- **Goal:** Match RFP specs quickly to product SKUs
- **Pain Points:** Manual spec matching, time pressure, parallel RFPs
- **Need:** Automated spec comparison & match scoring
- **How AI Help:** Technical Agent gives top 3 SKU matches with Spec Match %

Solution Hypothesis



- Design a multi-agent AI ecosystem for RFP response
- Sales Agent auto-detects tenders from web sources
- Technical Agent matches RFP specs with OEM SKUs (“Spec Match %”)
- Pricing Agent estimates cost using synthetic pricing data
- Main Orchestrator consolidates & submits the final RFP package
- To create a scalable, autonomous workflow improving speed & win rate

Multi-Agent System Architecture



Can be used to generate RFP response

Technical Architecture

Frontend

- UI: React.js
- Styling: Tailwind CSS
- Routing: React Router
- Real-time: Socket.io-Client
- API Calls: Axios

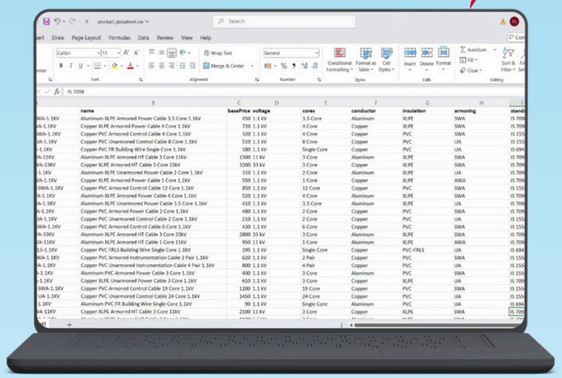
Backend

- Core: Node.js & Express.js
- Database: MongoDB & Mongoose
- Authentication: JWT & bcryptjs
- Real-time: Socket.io (Server)
- File Uploads: Multer & csv-parser

AI agents

- Cheerio: Web scraper agent for parsing RFP HTML.
- string-similarity: The "ML" library for "fuzzy" string matching.
- Algorithm: Uses Sørensen-Dice coefficient for spec-metrics matching

Product Datasheet



- It serves as the core reference for the Technical Agent to match RFP specifications.
- It lists all available product SKUs along with their technical and pricing details.

product_datasheet.csv

sku	name	basePrice	voltage	cores	conductor	insulation	armoring	standard
LT-AL-3.5C-XLPE-SWA-1.1KV	Aluminum XLPE Armored Power Cable 3.5 Core 1.1kV	450	1.1 kV	3.5 Core	Aluminum	XLPE	SWA	IS 7098
LT-CU-4C-XLPE-SWA-1.1KV	Copper XLPE Armored Power Cable 4 Core 1.1kV	720	1.1 kV	4 Core	Copper	XLPE	SWA	IS 7098
CTRL-CU-4C-PVC-SWA-1.1KV	Copper PVC Armored Control Cable 4 Core 1.1kV	320	1.1 kV	4 Core	Copper	PVC	SWA	IS 1554
CTRL-CU-8C-PVC-UA-1.1KV	Copper PVC Unarmored Control Cable 8 Core 1.1kV	510	1.1 kV	8 Core	Copper	PVC	UA	IS 1554
BW-CU-1C-PVC-FR-1.1KV	Copper PVC FR Building Wire Single Core 1.1kV	180	1.1 kV	Single Core	Copper	PVC	UA	IS 694
HT-AL-3C-XLPE-SWA-11KV	Aluminum XLPE Armored HT Cable 3 Core 11kV	1500	11 kV	3 Core	Aluminum	XLPE	SWA	IS 7098
HT-CU-3C-XLPE-SWA-33KV	Copper XLPE Armored HT Cable 3 Core 33kV	3200	33 kV	3 Core	Copper	XLPE	SWA	IS 7098
LT-AL-2C-XLPE-UA-1.1KV	Aluminum XLPE Unarmored Power Cable 2 Core 1.1kV	310	1.1 kV	2 Core	Aluminum	XLPE	UA	IS 7098
LT-CU-1C-XLPE-AWA-1.1KV	Copper XLPE Armored Power Cable 1 Core 1.1kV	550	1.1 kV	1 Core	Copper	XLPE	AWA	IS 7098
CTRL-CU-12C-PVC-SWA-1.1KV	Copper PVC Armored Control Cable 12 Core 1.1kV	850	1.1 kV	12 Core	Copper	PVC	SWA	IS 1554
LT-AL-4C-XLPE-SWA-1.1KV	Aluminum XLPE Armored Power Cable 4 Core 1.1kV	520	1.1 kV	4 Core	Aluminum	XLPE	SWA	IS 7098
LT-AL-3.5C-XLPE-UA-1.1KV	Aluminum XLPE Unarmored Power Cable 3.5 Core 1.1kV	410	1.1 kV	3.5 Core	Aluminum	XLPE	UA	IS 7098
LT-CU-2C-PVC-SWA-1.1KV	Copper PVC Armored Power Cable 2 Core 1.1kV	480	1.1 kV	2 Core	Copper	PVC	SWA	IS 7098
CTRL-CU-2C-PVC-UA-1.1KV	Copper PVC Unarmored Control Cable 2 Core 1.1kV	210	1.1 kV	2 Core	Copper	PVC	UA	IS 1554
CTRL-CU-6C-PVC-SWA-1.1KV	Copper PVC Armored Control Cable 6 Core 1.1kV	430	1.1 kV	6 Core	Copper	PVC	SWA	IS 1554
HT-AL-3C-XLPE-SWA-33KV	Aluminum XLPE Armored HT Cable 3 Core 33kV	2800	33 kV	3 Core	Aluminum	XLPE	SWA	IS 7098
HT-AL-1C-XLPE-AWA-11KV	Aluminum XLPE Armored HT Cable 1 Core 11kV	950	11 kV	1 Core	Aluminum	XLPE	AWA	IS 7098
BW-CU-1C-PVC-FRLS-1.1KV	Copper PVC FRLS Building Wire Single Core 1.1kV	195	1.1 kV	Single Core	Copper	PVC-FRLS	UA	IS 694
INST-CU-2P-PVC-SWA-1.1KV	Copper PVC Armored Instrumentation Cable 2 Pair 1.1kV	620	1.1 kV	2 Pair	Copper	PVC	SWA	IS 1554
INST-CU-4P-PVC-UA-1.1KV	Copper PVC Unarmored Instrumentation Cable 4 Pair 1.1kV	800	1.1 kV	4 Pair	Copper	PVC	UA	IS 1554
LT-AL-3C-PVC-SWA-1.1KV	Aluminum PVC Armored Power Cable 3 Core 1.1kV	400	1.1 kV	3 Core	Aluminum	PVC	SWA	IS 1554
LT-CU-3C-XLPE-UA-1.1KV	Copper XLPE Unarmored Power Cable 3 Core 1.1kV	610	1.1 kV	3 Core	Copper	XLPE	UA	IS 7098
CTRL-CU-19C-PVC-SWA-1.1KV	Copper PVC Armored Control Cable 19 Core 1.1kV	1200	1.1 kV	19 Core	Copper	PVC	SWA	IS 1554
CTRL-CU-24C-PVC-UA-1.1KV	Copper PVC Unarmored Control Cable 24 Core 1.1kV	1450	1.1 kV	24 Core	Copper	PVC	UA	IS 1554
BW-AL-1C-PVC-FR-1.1KV	Aluminum PVC FR Building Wire Single Core 1.1kV	90	1.1 kV	Single Core	Aluminum	PVC	UA	IS 694
HT-CU-3C-XLPE-SWA-11KV	Copper XLPE Armored HT Cable 3 Core 11kV	2100	11 kV	3 Core	Copper	XLPE	SWA	IS 7098

This dataset enables the AI system to calculate a Spec Match (%) between RFP requirements and available OEM products.

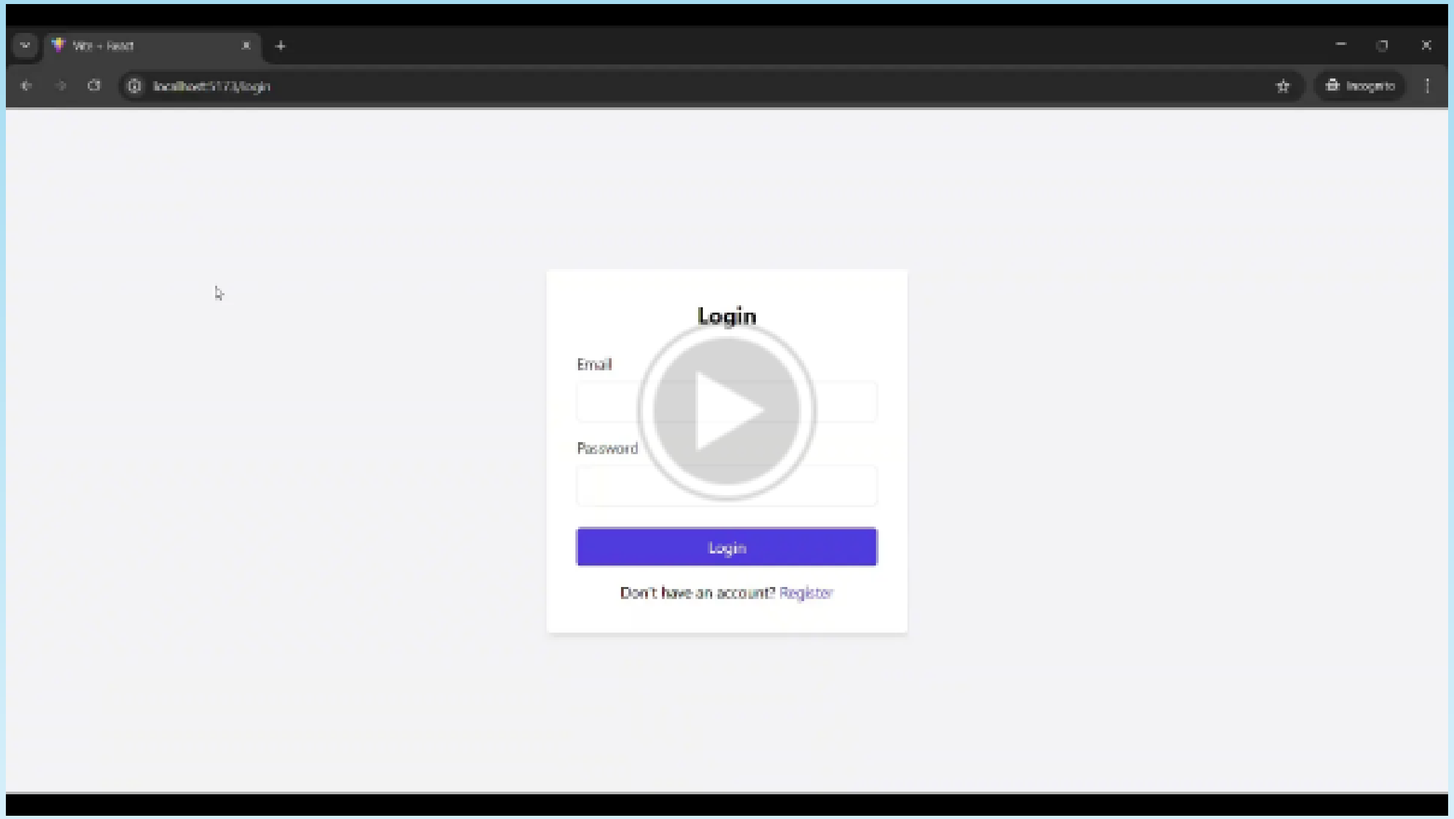
Spec-Metrics Matching

It is the process of **comparing technical specifications from an RFP** (like voltage, conductor type, etc.) with those in your product database to find the best match. It identifies how closely the two sets of specs align and produces a match score.

PERFECT MATCH

Sørensen–Dice Coefficient

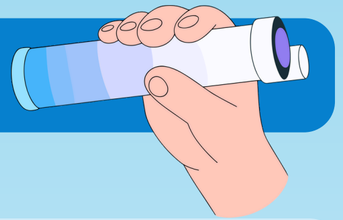
To achieve this, we use the Sørensen–Dice Coefficient — a **similarity algorithm from Natural Language Processing (NLP)**.
It measures how similar two strings are, even if they're not identical. For example, it recognizes that "Aluminum" and "Aluminium" are almost the same, unlike a strict equality check.



Drive link https://drive.google.com/file/d/1k3yF785NmWTwa84ChJzEjsY0B_KEReK2/view?usp=sharing

Incorrect RFP Parsing	**Pitfall :** Sales Agent may miss data due to mixed formats (PDF, HTML, DOCX) **Mitigation:** Use structured parsing + validation; add confidence scoring and fallback review
Pricing Inaccuracies	**Pitfall :** Static or outdated price data causes unrealistic totals. **Mitigation:** Maintain updated price tables; add validation and manual override
Coordination Failures	**Pitfall :** Orchestrator may face timeouts or missing agent responses **Mitigation:** Maintain updated price tables; add validation and manual override
Data Format Inconsistency	**Pitfall :** RFPs arrive in varied layouts or file types **Mitigation:** Standardize all inputs to JSON; use template recognition

Future Scope



- **Integrate tender APIs** – Automate data collection by directly linking to government or vendor tender portals.
- **Self-learning product database** – Build a smart database that improves accuracy by learning from past entries.
- **Real-time ERP integration** – Connect with ERP systems for instant and verified pricing or inventory updates.
- **Add predictive bid scoring model** – Use AI to predict bid success and optimize proposal strategies

CONCLUSION

- This project successfully demonstrates how Agentic AI can revolutionize industrial workflows by automating the entire RFP response process through intelligent, collaborative agents.
- By mimicking real-world departmental roles — Sales, Technical, and Pricing — the system achieves faster, more accurate, and scalable tender management.
- It stands as a practical step toward AI-driven enterprise automation, bridging efficiency, intelligence, and innovation in B2B operations.

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